L4687-1
11/08/89

THE M... GRO...

inc.

THE HOTTEST ENTREPRENEUR IN AMERICA

•144F**********3-DIGIT 208
•450OUCSRI93•
450541 450 OUCSRI90 014D
CONG INFO SERV COMPLIMENTARY
SRI ACQUISITION P01R
4500 E WEST HWY •EL
BETHESDA MD 20814

01
0 884265 7
02749

JANUARY 1989 VOL.11 NO. 1

CONTENTS

FEATURES

28 FACE-TO-FACE
Smart Machines, Smart People
According to Shoshana Zuboff, whatever you've invested in technology, chances are you're not getting your money's worth

39 THE NEW ECONOMY
The Disciples of David Birch *BY JOHN CASE*
A new generation of researchers is out to discover how the U.S. economy really works

47 ANATOMY OF A START-UP
Made in the U.S.A. *BY TOM RICHMAN*
Can appliance-control maker ACT Inc. become both the low-cost producer *and* the high-quality provider?

54 THE HOTTEST ENTREPRENEUR IN AMERICA
Cowboy Capitalist *BY BO BURLINGHAM & CURTIS HARTMAN*
Inside the private world of America's most public entrepreneur

70 **The Innovative Upstarts** *BY JOEL KOTKIN*
Why a group of technology newcomers are moving innovation out of the R&D lab and into the marketing department

COLUMNS

25 **Required Reading:** Why 'Fixes' Fail. *BY JOHN CASE*
CEOs often rely on the latest fad to try to transform their companies—then wonder why nothing changes

108 **Marketing:** Mission Impossible? *BY PAUL B. BROWN*
Three companies are learning the hard way that a good idea is not enough

112 **The Law:** Who Benefits? *BY MARISA MANLEY*
New laws require that you test your health- and life-insurance benefit plans this year if they are to remain tax free

116 **Capital:** Seize the Time. *BY ELLYN E. SPRAGINS*
For the next nine months or so, there will be lots of investment money out there looking for solid companies

118 **Managing People:** Owning Up. *BY BRUCE G. POSNER*
How to make your employees 'owners' without giving up a single share of stock

121 **Finance:** No More Trivial Pursuits. *BY CHARLES W. KYD*
How to avoid wasting time on irrelevant data

125 **Taxes:** Ways to Reduce Estate Taxes. *BY IRVING I. BLACKMAN & JULIAN BLOCK*
. . . plus a new mileage allowance, planning for capital losses, late filing, and making loans

DEPARTMENTS

11 **Letters:** The banking debate; demystifying PR; and the mail on 'The Superman Complex'

16 **Insider:** New private-placement rules; free equity; Hotline; New Businesses

106 **Hands On:** The advantages of negative references; talking up safety; where VC money is going

135 **Investing in Growth Companies**

INC. COVER STORY

54 H. Ross Perot
The hottest entrepreneur in America

28 Shoshana Zuboff
Smart machines, smart people

116 The Ziffs
Cashed out but still in control

COVER PHOTOGRAPH
by
Nigel Dickson

INSIDER

A CAPITAL IDEA

It's too early to start cheering, but the Securities and Exchange Commission may soon make life a lot easier for companies in need of outside capital. Last October, it quietly released a proposal to change the rules that govern private-placement trading. If adopted, the new rules could dramatically alter the burgeoning private-placement market, making it easier and cheaper to get loans and equity.

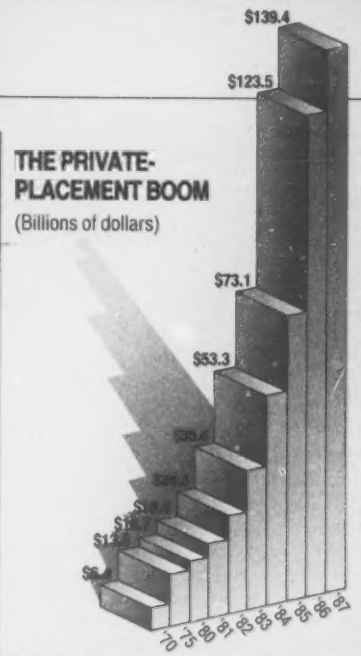
The changes are designed to loosen the restraints on private-placement buyers, who are now generally required to hold an investment at least two years before selling it to another investor. The current rules thus limit the ease with which insurance companies and other institutions can tailor their private-placement portfolios to fit their internal cash-flow needs.

The new rules would make the private market a lot more inviting for institutional investors. Institutions would be free to sell private placements immediately, without notifying the SEC, as long as the securities are bought by investors with assets greater than $100 million. In addition, smaller institutions (such as banks and pension funds) with more than $5 million in assets would be allowed to buy securities not listed or traded publicly on any U.S. exchange.

All of this adds up to that most desirable trait in a market: liquidity. The more easily an investor can shed an investment, the more likely he or she is to make it in the first place. The implications? First, the cost of private-placement capital would probably fall, since investors wouldn't have to cushion themselves from the risks of being saddled with an investment over a long period. Second, a more liquid market is likely to attract a greater number of institutional players—with the result that capital seekers may find themselves in the enjoyable position of watching institutions compete for their business. Many investors will be actively looking to make loans in areas previously ignored by established players, according to James R. Wilson, senior vice-president of Equitable Capital Management Corp.'s private-placement unit. One target market: smaller companies.

None of this is likely to happen overnight, however. The SEC took two years to develop the proposed rule changes; it will undoubtedly take several months before making them formal.

—Ellyn E. Spragins



SAM WARD

THE PRIVATE-PLACEMENT BOOM
(Billions of dollars)

Source: IDD Information Services and *Investment Dealers' Digest*

Annual volume of private placements
The private capital market just keeps growing.

FAILURE 101

To get a good grade in Jack Matson's class, you have to fail—badly. That's because the goal of the course at the University of Michigan business school is to "maximize learning from failure," according to Matson. "If you are doing something innovative, you are going to trip and fumble. So the more failing you do faster, the quicker you can get to success."

BRENDAN ROSS

Professor Jack Matson with students
Can he succeed in teaching them failure?

In that spirit, Matson begins his course by giving each student a bunch of Popsicle sticks and telling them to make something ridiculous that will never sell. This year's class came up with such contraptions as a hurricane-strength box kite and a device that supposedly allows you to identify the sections of the brain. Matson then instructed the students to go out and peddle these things, hoping they would feel the sting of failure. Inexplicably, two-thirds of the students sold their inventions. "My exercises sometimes have to fail," the professor admits. Students also write a Failure Résumé, designed to show how their failures have shaped them, and they observe Dress for Failure Day, by coming to class in ridiculous getups, because—says Matson—"in taking risks, you are bound to look foolish."

Matson traces the genesis of his course back to the day six years ago when he was hit by lightning. "When I came really close to the *ultimate* failure, I decided that I wanted to bring out creative things inside of me." A civil-engineering teacher, he tried some new courses ("a big failure") and launched a consulting business ("a total flop"). Soon he had developed a new expertise. "Failure is my thing," he says proudly.

By the end of the semester Matson's students must actually start a business. What if they don't? "Those who fail the course can take it again," he says. "But I firmly believe it's within every student not to fail at failure."

—Joshua Hyatt

HANDS OFF

It's a dirty job, but somebody's got to do it, and Eugene T. Hearl Jr. thinks he is just the guy. His business: cleaning up dog droppings in backyards. After 20 months in operation, his company—Gene's Canine Waste Removal Co., based in Syracuse, N.Y.—claims "well over a hundred" clients paying $5 a week to have their lawns de-pooped. Meanwhile, Hearl, a former plumber, keeps looking for new lawns to conquer. He dreams of operating in every city and town in America. "I want to be number one in the 'number two' business," he says.

—M.E.M.

MIKE REED

INSIDER (continued)

THE DISCIPLES OF DAVID BIRCH

A new generation of researchers is out to discover how the U.S. economy really works

BY JOHN CASE

At first glance, it could be just another scholarly skirmish—a dispute among professors over the reliability of certain job-generation statistics. But the real subject of the debate is something far more important: the role of entrepreneurship in the revitalization of the U.S. economy.

The statistics in question first surfaced nearly 10 years ago, when Massachusetts Institute of Technology researcher (and INC. columnist) David L. Birch wrote that small businesses create 82% of new U.S. jobs. It was a preliminary number, based on a pioneering method of study, and it has long since been revised and refined to reflect variations of time and place. But Birch's critics are still gnawing on that old figure. "Small businesses do not create 82% of all new jobs," trumpeted a headline on a May 1988 *Chicago Enterprise* article by George Kalidonis, a professor at the Keller Graduate School of Management, in Chicago. Alleging "faulty methodology"—misinterpretation of data and other statistical sins—Kalidonis the following month announced that 82% was a "dubious claim." In April two Harvard economists published an article in *The Washington Post* purporting to debunk small-business mythology. And what was Myth #1? You guessed it—that small businesses create 8 out of 10 new jobs.

As it happens, these particular critiques themselves reflect a breathtaking combination of misunderstanding and sloppy research (see box, "Birch's Revenge," page 40). But the critics' ineptitude is perhaps less telling than the passion and thrust of their arguments. If there's going to be a backlash against the Age of Entrepreneurship, we may be witnessing the opening salvos.

Consider: For most of the postwar era, the well-being of the U.S. economy seemed to depend on the health of its large companies. When some of the biggest ones found themselves battered by foreign competition, the economy as a whole felt shaky. But in the 1980s the picture changed dramatically—and quickly. Hot new growth companies flooded the market with everything from clothing to computers. Wall Street's over-the-counter market woke up. Venture investing boomed. In this climate, David Birch's widely publicized figures about small-company job generation were electrifying. They alerted both Congress and local economic-development officials all over the nation to the importance of these new companies,

▶ STORY PROPOSAL ◀

The debate keeps raging: How important are small, growing companies to the U.S. economy? Do they really create most of the new jobs? There's a lot of bad information on the subject being bandied about—but increasing numbers of researchers are assembling hard evidence, even going out and counting companies themselves. Let's talk with them and report what they're learning. —J.C.

RICHARD HOWARD

DAVID L. BIRCH

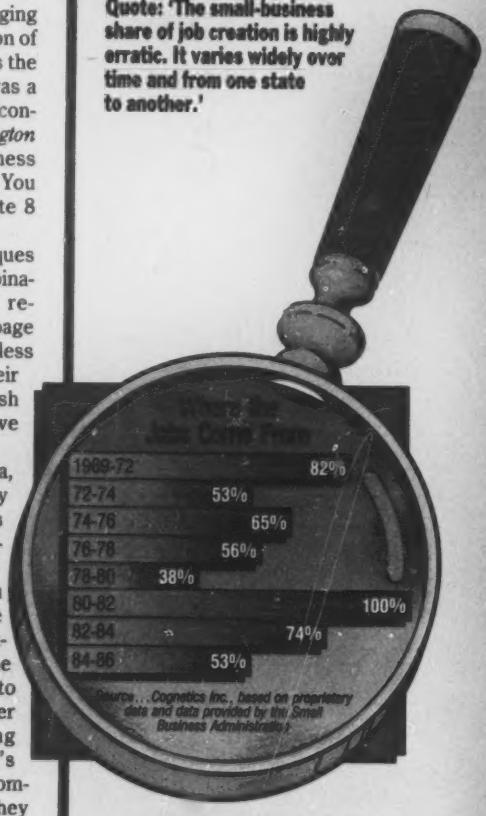
Age: 51

Affiliation: Massachusetts Institute of Technology

Background: physics

Claim to fame: pioneer in study of job generation

Quote: 'The small-business share of job creation is highly erratic. It varies widely over time and from one state to another.'



The small-business job engine
What percentage of jobs did companies with fewer than 100 employees create?

ALL CHARTS BY SCOTT MACNEIL

BIRCH'S REVENGE

The only thing you'll ever have to read about job generation

Pity David Birch. Not long after he wrote "The Job Generation Process" back in 1979, two researchers employed by Washington's Brookings Institution published a paper declaring him wrong. They had examined the job-creation data for 1978 to '80, they said, and discovered that small companies created only about 40% of the new jobs, not the 82% Birch had claimed for the years 1969 to '76. Maybe Birch had screwed up, they suggested, by confusing *companies* with individual workplaces. If IBM builds a new distribution facility and hires 100 employees, that's not a new business.

Today, many years later, the charge lives on. George Kalidonis, a professor at Chicago's Keller Graduate School of Management, refers in a recent article to "Birch's curious practice of counting branch offices of large corporations as 'small businesses.' " Harvard faculty members James Hamilton and James Medoff write in *The Washington Post* that "Birch generally defined business size by the number of people who work at a given location rather than the number working for the firm in total." Both cite the Brookings figure as evidence that Birch was wrong.

Well, Birch wasn't wrong. He never confused companies with establishments. On the contrary, he had undertaken "the massive task of assembling all the individual establishments into the 'families' (or firms) to which they belong." Eventually, the original disputants realized that their disparate conclusions were due partly to differences in their statistical methods and partly to real differences in the time periods they studied.

Methodological disparities persist. Researchers using the Small Business Administration's database—the original basis for the Brookings study—consistently come up with slightly lower estimates of job generation by small companies than Birch's. But the variation is typically small, and it's nowhere near as significant as the variation from state to state and from time period to time period. In recessions, for example, large businesses are typically cutting back their work forces, so small companies are likely to account for 100% of the net new jobs created. In boom times the proportion will be smaller. So it is with states. Minnesota, Massachusetts, and other states with many large, successful technology-based companies, writes Birch in his book *Job Creation in America,* find a larger share of new jobs coming from big companies. States such as Michigan, dominated by big-but-shrinking companies, find exactly the opposite.

So, what's the truth? Do small businesses generate 8 out of 10 new jobs? Only sometimes—and only in some places. "When you think about it," says David Birch with a smile, "it's perfectly obvious."

thereby helping to spawn a range of policies favorable to entrepreneurship. They encouraged big corporations to seek out new businesses as customers, suppliers, and joint-venture partners. Before long, small business wasn't just an economic sideshow. It was the Main Event.

But the change in the program has left some members of the audience feeling restive. A front-page *New York Times* story last June reported a "reappraisal" of the value of entrepreneurship by a "growing number of influential scholars and business executives." The reappraisal, said the article, "marks a sharp departure from the years in which entrepreneurs were lionized by virtually everyone as innovators, and small companies were praised as the source of most new jobs." Washington, too, has witnessed a noticeable cooling of enthusiasm. "People on Capitol Hill used to sit up and take notice when you showed how a program would benefit small business," said one recently departed Small Business Administration official. "But lately I've been getting the response, 'Don't talk to us about helping small businesses. They already get too much.' "

In this context, potshots such as those against Birch echo well beyond the halls of academe. For the reality of entrepreneurship is that it flourishes best in a climate of support—when financial institutions provide capital, when large corporations pay attention to small ones, when governments at least don't obstruct company founders and at best offer them helping hands. That climate of support, in turn, depends in good measure on what scholars tell us about economic reality. If someone were to show that the whole entrepreneurial phenomenon is overblown and overrated—that the U.S. economy still depends, as it has for most of this century, on the health of its giant corporations—then the climate would turn chilly. And a lot of fledgling companies would be frozen out of the marketplace.

All of which makes the work of an eclectic collection of researchers—sociologists, political scientists, economists—of more than passing interest. For according to the mosaic of information this group is beginning to assemble, the entrepreneurial revolution may run far deeper than anyone has so far suspected.

The mosaic begins with a few basic pieces. How many new businesses are there? Where are they, and what are they doing?

Surprising as it may seem, no one yet knows definitive answers to such questions. No government agency disseminates comprehensive information on new companies nationwide. Dun & Bradstreet Corp.'s widely quoted "new incorporations" figure includes numerous entities incorporated purely for legal or tax reasons. The most widely used source of data is Dun's Market Identifiers (DMI) listing, which provides information on the roughly 6 million active companies in D&B's credit files. Birch's database begins with the DMI. So do the two databases maintained by the SBA.

If the DMI were a true census, it might be sufficient. In fact, it is limited in scope and uneven in quality, as even its defenders acknowledge. Many companies, particularly in the service sector, are likely to be a couple of years old before they come to Dun's attention, and smaller ones may never be listed at all. Since Dun's reporters are mainly interested in financial data, the information they gather tends to be spotty on matters such as start dates and sales figures. Birch and other researchers do their best to weed out obvious errors, to estimate the number of missing companies, and to correct for statistical quirks. But skeptics abound. "D&B," asserts economist Jonathan S. Leonard, of the University of California, "is pretty lousy data."

All this may explain how Paul Reynolds found himself counting companies. Reynolds, a soft-spoken sociologist, works at the

University of Minnesota. Several years ago—"in the midst of a career change," he says, which in academia means shifting from one research interest to another—he began thinking about the effects of entrepreneurship. Was it really making a difference to local and regional economies? How many new businesses were there, anyway?

As it happened, the people at the university's Center for Urban and Regional Affairs were interested in the same questions. So in 1984 Reynolds got a grant for a small pilot study, gathering information on about 550 new businesses in Minnesota. Two years later he contracted with the Appalachian Regional Commission, a 13-state development agency that is based in Washington, to do a full-scale survey of new-business creation and job generation in Pennsylvania. At the same time, he undertook a similarly complete study back home in Minnesota, this one funded by 10 separate agencies and institutes.

The critiques of David Birch reflect a breathtaking combination of misunderstanding and sloppy research.

"Paul Reynolds," a colleague says admiringly, "knows more about this stuff than anyone else."

Reynolds set out both to measure the extent of new-business formation in the states he was studying and to learn more about the companies being created. His starting point, he figured, had to be the DMI. "It's an imperfect but necessary data source," he says. "There's really nothing else." But he knew too that he wanted firsthand information, gathered and verified by a staff he would hire and train himself.

By the time of the second Minnesota study, begun in early 1986, he had the methodology pretty well worked out. First, he ascertained that the DMI listed some 24,000 companies in Minnesota started between 1979 and 1984. Dividing that group by region, industry, and start date, he selected a representative sample of more than 5,000. The plan was that he and 10 researchers would call every company in the sample. When they reached executive officers of a business, they'd ask them a few screening questions, such as when the company was founded and whether it was independently owned.

Calling began in late fall of 1986. As the reports piled up, though, Reynolds noticed the same disconcerting phenomenon he had observed in his other studies. The D&B listings just weren't checking out very well. No, we're not a new company, some respondents would say. We just changed ownership, or restructured, or whatever, in the year you thought we started. Others had gone out of business. Still others couldn't be found at all or were invalid listings, such as duplications. All told, fully half of D&B's supposed new businesses didn't check out. That was almost exactly what Reynolds had found in Pennsylvania and in the earlier Minnesota study. If the case for entrepreneurship rested on the DMI, so it appeared, it was resting on a slim reed indeed.

But Reynolds wasn't through. Companies that qualified as both new and independent got a 16-page questionnaire. How many employees had they hired? Where did they do most of their business—just locally or in wider markets? Who founded the company, and why did it locate where it did? If the companies didn't respond to a couple of mailings, Reynolds's researchers got on the phone again and again, until they had good data on 75% of the group. Then it was time to put the information into the computer and see what it said.

What leaped out at Reynolds, in the end, wasn't the startling inadequacy of D&B's statistics. It was the startling importance of entrepreneurship *even after half the apparent new companies had vanished into thin air*. Like Pennsylvania, Reynolds discovered, Minnesota depended heavily on new-business formation for its economic growth. Translating his sample into statewide figures cut the number of new companies from the 24,000 listed by D&B to 12,000. But these new businesses alone accounted for 119,000, or 42%, of the 282,000 net new jobs added to Minnesota's economy between 1978 and 1986.

That figure was significant, particularly since it now had the kind of scientific validation D&B alone could never have provided. But it was still a dramatic understatement, because it didn't include any of the companies D&B missed. Reynolds made no independent attempt to estimate that number himself, relying instead on extensive calculations carried out by David Birch and Susan MacCracken a few years earlier. If the Birch-MacCracken estimates were accurate, Reynolds reported, new companies in Minnesota accounted for essentially all of the state's net job growth.

In analyzing the questionnaires, moreover, Reynolds realized that he was uncovering two distinct kinds of entrepreneurship—and that only one of them was really responsible for growth. Nearly three-quarters of the companies his staff contacted grew slowly—less than $100,000 in new sales per year—or not at all. Their emergence, Reynolds says, "tends to reflect a turnover or replacement process." But another group of companies seemed to be filling niches that hadn't existed before, as reflected in significantly faster growth. These fast growers—concentrated in the Twin Cities area—made up only 25% of all start-ups. But they accounted for 60% of new jobs attributable to new companies, 80% of new-company sales, and 80% of new-company

STEVE SCHNEIDER

PAUL REYNOLDS

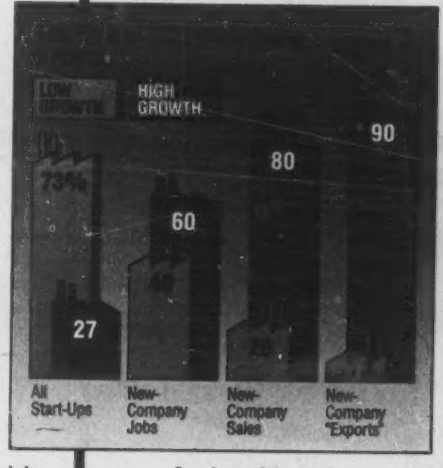
Age: 50

Affiliation: University of Minnesota

Background: sociology

Claim to fame: developer of field-tested database

Quote: 'It's a small fraction of these new companies that are making the real contribution. That's a controversial finding—it implies that public agencies might want to focus their efforts on just these firms.'



Leaders of the pack
How much of the start-ups' contribution comes from the fast growers?

JACK VAN ANTWERP

JOHN E. JACKSON

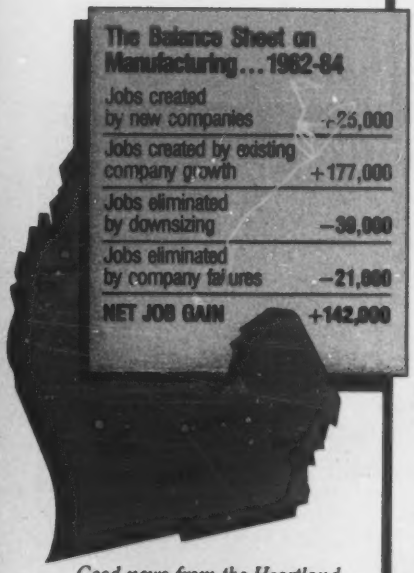
Age: 46

Affiliation: University of Michigan

Background: political economy

Claim to fame: pioneer in use of unemployment-insurance data

Quote: 'Despite the worst depression in 50 years, almost as many manufacturing firms started in Michigan as went out of business. In business services, there were three new firms for every two failures.'


The Balance Sheet on Manufacturing... 1982-84
Jobs created by new companies +25,000
Jobs created by existing company growth +177,000
Jobs eliminated by downsizing −39,000
Jobs eliminated by company failures −21,000
NET JOB GAIN +142,000

Good news from the Heartland
How did Michigan's manufacturers do following the last recession?

"exports," that is, goods or services sold outside of Minnesota. They were thus responsible for a vastly disproportionate share of the development that was attributable to entrepreneurship.

Paul Reynolds is one of the leaders of what might be called the "counting-companies" school of entrepreneurship studies. It's a demanding art, if only because it requires the practitioner to scare up large grants. As a result, its adherents are few. Even so, it promises answers to questions that have vexed public officials and businesspeople since the dawn of capitalism. Do tax rates affect new-company formation? (No, says Reynolds, they make no difference.) Do people move into a state to start a business? (No again—they start companies where they live). Does a region need manufacturing to prosper? (Doesn't seem so. William Beyers, a geographer at the University of Washington, contacted some 2,000 service companies in the Seattle area and asked about the extent of each company's exports outside the Seattle area. His conclusion: "The growth of our regional economy is being fueled as much by the export of services as by goods.")

At least some of the questions, though, may be answered more quickly—and less expensively—by a group of social scientists who are already mining a big, computer-readable, and largely untapped source of data about new businesses, compiled on a state level and completely independent of Dun & Bradstreet. Among this group is the University of Michigan's John E. Jackson.

Jackson, a political economist, had been doing research at Harvard during the early '70s, when the Massachusetts economy was still smarting from the southward migration of textile and other old-line manufacturers. "When I moved to Michigan in 1980, I heard the same story," he remembers, "only you had to substitute Japan for the Carolinas and automobiles for textiles. But now people were saying, why couldn't we be more like Massachusetts?"

With good reason. Between 1978 and 1982, Michigan lost close to 400,000 manufacturing jobs, more than half of them in the automobile industry alone. At the depth of the 1982 recession, unemployment hit an incredible 17%. "Residents were bombarded almost daily with stories of firms and people leaving Michigan for the Sun Belt," Jackson says. Asked to serve on an economic-development task force organized by Democratic governor James Blanchard, however, he realized how little was really known about the Michigan economy. That was when he began looking into the state's unemployment-insurance data.

ES-202 files, as state unemployment records are known, record every company operating in a state from the moment it establishes a payroll. They're updated quarterly, with new employment figures for every company. And they record company failures the moment a business stops incurring tax liability. A few states don't allow outsiders access to the files, while in others the files aren't easily accessible. Michigan offered no such obstacles—and the data, it turned out, were of high quality. "Not only are the data more timely than Dun & Bradstreet's," Jackson explains, "but Michigan is particularly good at flagging predecessor and successor companies [when a company is restructured or changes ownership]. D&B doesn't do that so well."

Uncertain as to what he would find, Jackson got tapes beginning in 1978 and ending, for the first phase of his research, in 1984. Running them through his computer, he found that the press had missed fully half the story.

Yes, the automobile industry was shrinking. Even during the post-1982 recovery it never came close to replacing the number of workers laid off in the recession. And yes, many other industries—steel, machine tools—had plenty of dying or declining companies. But side by side with this decaying economy was what amounted to another economy being born. New and growing companies were generating jobs by the tens of thousands. In manufacturing alone, nearly as many companies were created as went out of business. Of the manufacturers that had survived over the six-year period, more than half increased their employment, and the average increase was nearly 50%.

To Jackson, it was an astonishing picture. Everyone knew that Massachusetts had plenty of young, growing companies—but the Bay State was world famous as a hotbed of high technology. This was *Michigan*, a state that had always depended on durable-goods manufacturing and that was regularly berated for having one of the worst business climates in the nation. Moreover, though some of the new jobs were in predictable sectors such as computer services, many were in the same industries that seemed to be in decline.

In machine tools, for instance, Michigan began and ended the six-year period with roughly 1,850 companies. Behind that picture of stability, however, was a business maelstrom. Some 660 companies shrank. More than 400 went out of business entirely. But as many companies were born as died, and more than 700 of the existing companies expanded. Machine tools were not what Jackson or anyone else would call a sunrise industry, but it was, he found, a fertile ground for entrepreneurship and growth.

At the state level—the only level, for the moment, where ES-202 data are useful—such findings echo loudly. "Jackson's study helped convince us to keep supporting manufacturing," says Mark Haas, chief economist with Michigan's Department of Commerce. "We also learned to look not just at industries but at individual companies. Some businesses will be growing even in industries that are shrinking, and state economic-development policy has to take this into account."

What unemployment files or D&B listings provide are raw data, much like that in a census. The data tell the researcher how many businesses are starting up, what industries they're in, where employment growth is taking place. Surveys such as Reynolds's add information about the entrepreneurs and how they're building their companies. But such information isn't easy to evaluate. It raises as many questions as it answers. Would any state in any period show lots of new companies starting up? Do newer, smaller businesses have any advantage that older, larger ones lack? Historically, big companies in many industries have simply muscled out small ones. If that is changing, there must be reasons. The reasons, in turn, should shed light on how durable the current entrepreneurial trend is.

For better or worse, it's likely to be economists who answer such questions. They're the ones who are supposed to have both an overview of the economy and the theories to explain why it works the way it does. In the past, however, economics would have had surprisingly little to contribute. Most economists have been content to study inputs, such as employment trends and capital flows, and outputs, such as production figures and trade patterns, without examining the organizations that turn one into the other.

It may be no accident that Reynolds, Jackson, and nearly everyone else counting new businesses are not traditional economists. (In fact, David Birch was trained as a physicist.) When *real* economists study individual companies or industries, acknowledges Zoltan J. Acs with a smile, "they concern themselves almost entirely with the large companies."

> ***What leaped out was the importance of entrepreneurship even after half the new companies had to be thrown out as bad data.***

Acs (rhymes with *scotch*) is one of a couple dozen academic and government economists who have been trying for several years to change this situation: to study how individual companies, small ones in particular, actually operate and thereby to evaluate the role that entrepreneurship plays in today's economy. As Acs and others describe it, creating such a field of study is remarkably similar to building a company. It takes money, a research technology, and a method of establishing yourself in the marketplace.

Money, in this case, was provided partly by the SBA's Office of Advocacy, created in 1976. Like many government agencies, the SBA disburses funds for studies it expects will bolster its mission. The technology, of course, was computerized data processing. "Only in the late '70s and '80s," explains Bruce Kirchhoff, former chief economist for the SBA, "were computers powerful and cheap enough to look at all the individual elements. You could tell the computer, 'OK, look at this list of a million firms and tell me which ones have added employees.' This was a revolution in methodology."

In academia, establishing yourself in the marketplace requires a combination of entrepreneurial marketing and rigorous quality control. Most of the entrepreneurship, everyone acknowledges, was provided by David Birch. "Birch did pioneering, path-breaking work," Acs observes, "and not only that, but he publicized it widely." Quality control, however, was another matter, at least in the view of some. Birch came under attack for the reliability of his data. He was criticized for not publishing his work in refereed economics journals, where it would be subjected to professional scrutiny before publication. "Mainstream economists are quick to jump down other people's throats for doing something differently," one says, "and Birch was doing things differently. A lot of economists were skeptical."

Slowly, however, much of the skepticism about this nascent field of study has abated. Two well-respected economists, William Brock, of the University of Wisconsin, and David Evans, of Fordham University, published a book entitled *The Economics of Small Businesses* in 1986, a volume that one practitioner says "put this field on the map." Brock, Evans, Acs, and others have published several articles in leading economics journals. The first issue of an international journal called *Small Business Economics* appears this month. Acs is one of two managing editors, and professional luminaries such as MIT's Lester C. Thurow serve on the editorial board.

As a field, small-business economics is still young. But the findings these economists have come up with, so far, shed light not only on how extensive a role entrepreneurship plays in our economy, but also on why. According to the new journal's lead article—written by Brock and Evans—we are witnessing a historic reversal in the century-old trend toward bigness in the U.S. economy.

The figures they cite are striking. For roughly the first three decades after World War II, the average size of U.S. companies increased. The self-employed—a category that includes many small-company owners as well as sole practitioners—dropped from about 20% of the work force to only 7%. The small-business share of value added dropped 4%, its share of employment 6%. Sometime during the '70s or early '80s, however, nearly all of these figures turned around. Average company size decreased, self-employment rose, and small companies accounted for a slowly increasing fraction of the labor force.

This phenomenon, other economists have discovered, doesn't simply reflect the continuing transition of the U.S. economy from manufacturing to services. On the contrary, the growing importance of small companies

JACK VAN ANTWERP

BO CARLSSON

Age: 46

Affiliation: Case Western Reserve University

Background: economics

Claim to fame: ground-breaking studies of effects of technology on manufacturing

Quote: 'Customers want variety. That undermines economies of scale—the big firms can't keep those mass-production lines going anymore.'

The new economies of scale
Has the long-term trend to large-scale production been reversed?

RICH FRISHMAN

WILLIAM B. BEYERS

Age: 48

Affiliation: University of Washington

Background: geography

Claim to fame: pioneer in studying service exports

Quote: 'We found we were looking into a bubbling cauldron of entrepreneurship, laced with expertise, specialization, and exploitation of market niches.'

Prosperity and the service economy
How many jobs are Seattle's business sectors creating through exports?

shows up as strongly in manufacturing as elsewhere. Edward Starr, an SBA economist, combed the agency's database of companies for the years 1976 through 1984 and found that small manufacturers' share of output and employment was increasing in nearly every broad industrial category. Nationally, according to Starr's figures, small manufacturers added about 1.2 million jobs during the period, while large manufacturers were cutting some 300,000 positions.

Bo Carlsson, an economist at Case Western Reserve University, in Cleveland, turned up even more striking data on changes in the metalworking industries between 1972 and 1982. (Metalworking includes machinery, aircraft, automotive industries, computers, and nearly everything else we generally think of as serious manufacturing.) During that time, both average company size and average plant size, as measured by employment, declined in nearly three-quarters of the category's 106 classifications, while the *number* of companies and plants in the industry as a whole increased more than 25%. In a working paper, Carlsson, Acs, and David Audretsch had shown that companies with fewer than 500 employees increased their share of metalworking production from 30% to 40% in 10 years, while companies with fewer than 100 employees jumped from 16% to 23%.

"That's a tremendous change," Acs says. "It shows there's a change in industrial structure that's taking place, from larger firms to smaller firms."

The reasons for this change are still largely a matter of speculation. An account of possible causes reads like a list of the past decade's megatrends: A culture of entrepreneurship. A more competitive economy. Deregulation. The fragmentation of markets. In effect, figuring out the causes of these ongoing changes is the task that the new field of small-business economics has set for itself.

In the meantime, some of the directions this research might take can be gleaned from the work of Carlsson. Back in 1982, as he tells the story, he was a visiting scientist at MIT and wondering what had gone wrong with the U.S. economy. It was buried in a recession. It had been battered by foreign competition. In such a climate, Carlsson felt, companies might be inclined to "deglomerate"—to divest themselves of ancillary businesses and product lines, to shed divisions and departments, to trim their work forces, and to focus on their core markets. Certainly there was plenty of anecdotal evidence to support such a hypothesis—but how could it be tested?

If the hypothesis was correct, he reasoned, the evidence would lie in measures of value added. A vertically integrated company adds immense value to its inputs, taking raw materials in one end of the factory and pushing finished products out the other end. In the new, more specialized environment, companies would be focusing on individual parts of the production process and therefore adding less value. Sure enough: when Carlsson tabulated the numbers, the ratio of value added to shipments had declined over a 10-year period in 88 of the 106 metalworking industries.

Carlsson had also begun an intensive study of machine tools while he was at MIT and had noticed another phenomenon. "For more than 150 years, most changes in production technology favored large-scale manufacturing relative to small-scale production," he says. By contrast, today's computer numerically controlled (CNC) machines operate economically at lower production levels and can easily be reprogrammed to turn out a wide variety of customized products. That gives small companies a key advantage.

Economists have found that the importance of small companies shows up as strongly in manufacturing as elsewhere.

John Jackson, who studied the Michigan economy, independently confirmed Carlsson's thesis. Michigan's machine-tool industry, he discovered, was split right down the middle: declining or dying companies lost 18,000 jobs over a six-year period, while new or growing companies created 15,000 new ones. Jackson and two colleagues had surveyed the industry separately in 1984, asking not only about changes in sales and employment, but also about the type of technology used. By far the greatest growth, both in jobs and in sales, took place among companies that utilized only CNC equipment. These companies, moreover, were significantly younger and smaller than the industry average.

Ever since David Birch sat down with a yellow pad to report his job-generation results, the small-business community has been quick to perceive the political implications of this field of study. "I had never talked to a small-business person in my life, and I had no idea there were small-business advocacy groups out there," Birch says, recalling his astonishment at the reaction to his original study. "Suddenly there I was, getting an award as SBA researcher of the year." Agencies such as the SBA and lobbyists such as the National Federation of Independent Business quickly latched on to Birch's work. If small companies create jobs, their argument ran, the government should do all it can to help them. Studies such as those by Reynolds and Jackson created similar stirs at the state level.

Scholarly research and politics, however, are uneasy bedfellows. Advocates for small business, Birch points out, often neglect to mention that most small companies grow scarcely at all, and that the job-creating high fliers such as Microsoft Corp. and Mrs.

Fields Inc. frequently don't have much in common with more traditional small enterprises. On the other side, Birch's own work is mistrusted by some academics because of his reputation as a partisan of entrepreneurship, who oversimplifies the world on behalf of new companies.

The issue comes into sharpest focus over job generation. Nearly everyone now agrees that many of the new jobs created each year are in small companies. But, ask critics such as James Medoff of Harvard, how durable are the jobs? How well do they pay? In general, Medoff and other economists have shown, large companies pay higher wages and provide better benefits than small ones. And at least some studies suggest that larger businesses are more stable employers. "If a job generated today is gone tomorrow, another job will have to be generated," Medoff says.

Birch critic George Kalidonis takes a different tack, charging that attributing job *creation* to the small company that happens to employ a new worker is an oversimplification. If an Illinois company sells its widgets to a California firm, Kalidonis argues—and if the order requires new printed material, thereby leading to 10 new printing jobs—it makes little difference if the jobs are in a big company or a small one. "The jobs," he writes, "were created by the California buyer who placed the order."

The trouble with such arguments isn't that they're wrong, but that they miss the point. In the recent past, big business really did provide high-paying, stable jobs—in the steel industry, the auto industry, and many others. It can no longer do so. Most growing companies can't yet either. But at least they're providing some jobs to replace the 3.1 million eliminated by the *Fortune* 500 over the past eight years. Kalidonis's notion of a demand-driven economy, similarly, makes sense only if we assume it's always big companies that "place the orders" and that small companies can only respond to such markets. It allows no room for small companies buying from one another or for small companies creating new markets through innovation. Kalidonis is getting at the notion of an economic "base"—that is, companies that export their goods or services outside their home region. But these days small companies as well as large ones fall into that category.

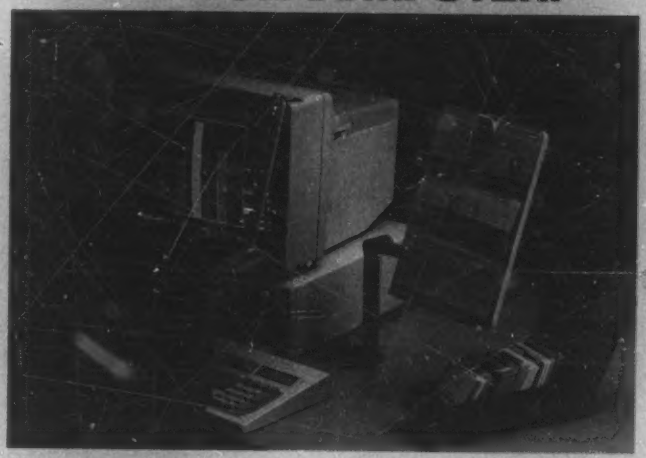
All this skirmishing is likely to continue. Entrepreneurship has had a long day in the sun, and it would be surprising indeed if it didn't experience a backlash. From an academic perspective, however, it no longer depends on pioneers such as Birch or indeed on any single school of thought. More people are studying it than ever before. What they're learning is not simply that small companies create jobs, but that our economy is undergoing changes affecting businesses of all sizes. Maybe they'll help us, over the next several years, understand those changes better than we do now. □

How the company that makes copiers keeps employees that can't be duplicated.

CROSS®
SINCE 1846

Why does Xerox make gifts of Cross writing instruments? Because they believe productivity will multiply when you treat your employees well. Cross will accurately reproduce your corporate emblem and provide personalized engraving. For our business gift catalog and information on new Gray by Cross (shown), write A. T. Cross Company, 70 Albion Road, Lincoln, Rhode Island 02865 on your company letterhead.

FELLOWES®...THE MOST PRODUCTIVE ACCESSORIES NEXT TO YOUR COMPUTER.



Fellowes will make you and your computer even more productive. Our broad line of anti-glare screens and copyholders make work easier to face. Our range of diskette storage accessories and printer stands will help organize the workplace.

Contact Fellowes or your nearest dealer for product details and more ways to increase productivity.

FELLOWES®
1789 Norwood Avenue, Itasca, IL 60143
(312) 893-1600

Circle No. 69 on Reader Service Card.

HANDS ON

A Manager's Notebook

TRAINING

LEARN FIRST, PAY SECOND

New, more efficient equipment is great, but it won't help your company until your employees have learned how to use it.

Quebecor America Inc.'s president and CEO John T. Collins has found a way to guarantee that the vendor's trainer, as well as his own managers and operators, work quickly to get the new machines on-line and the employees completely trained to run them. He withholds full payment until his operators confirm that they are 100% ready to go.

In addition to ensuring that the trainer works fast and well, the Needham, Mass., printing company's strategy ensures that employees take responsibility for fully understanding the equipment they'll be expected to make productive.

"It's as much psychological motivation as it is training," Collins says. "There's pride on the part of the employees when they tell their managers that they're ready to go. Consequently, they're much more motivated to do the job well." □

VENTURE CAPITAL:

WHERE'S THE MONEY GOING?

Industry	% of 1986 funds invested in industry	% of 1987 funds invested
Commercial communications	5%	5%
Telephone & data communications	11	10
Computer hardware & systems	18	14
Computer software & services	10	11
Noncomputer electronics	13	9
Biotechnology	5	6
Medical & health care	10	13
Energy & industrial related	7	7
Consumer related	9	15

Consumer-related businesses and the medical and health-care field were the main beneficiaries of increased venture capital interest. Computer hardware and systems and noncomputer electronics were the biggest losers.

Source: Venture Economics Yearbook, Venture Economics Inc., 1988

MARKETING

IF THEY CAN'T FIND IT, THEY CAN'T BUY IT

Effective distribution is tough for any new consumer-product company. So when Elizabeth Andrews, CEO of The Baby Bag Co., in Cumberland, Maine, began selling her innovative infant outerwear, she made sure buyers could find *her* even if they couldn't find a store that carried her goods. She stitched her new company's address and phone number right on every Baby Bag's label.

It seems to have worked. Though Baby Bag had difficulty winning shelf space from retailers, potential customers who saw the products being used at the grocery store or on the street were often intrigued enough to ask about them. Once they had the number, they could call Andrews to place an order or learn where the company's items were available for sale.

"Later, when Baby Bag became better known, retailers objected to the number because they thought it would take business away from them," Andrews says. Now that distribution is good, each Baby Bag has the company's address but not its phone number.

"We still get plenty of calls from customers in rural regions who are serious enough about wanting one that they dial information to get the number. And the 800 retailers love it because they get referrals." □

QUOTE OF THE MONTH

When my employees make mistakes trying to improve something, I give them a round of applause. No mistakes mean no new products. If they ever become afraid to make one, my company is doomed.'

—Jim Read, president and owner of The Read Corp., a Middleboro, Mass., construction-equipment manufacturer

TECHNOLOGY

A COMPUTER IN EVERY HOME

If your employees use computers off the job, they'll probably use them better at work. Walter Kisling, CEO of Multiplex Co., a St. Louis manufacturer of refrigerated drink dispensers, offers his staffers financing on their home computers—without interest and at a substantial savings.

The deal, though a valuable benefit for employees and their families, costs Multiplex little. When Kisling buys equipment for Multiplex's office, he passes the bulk discount along to employees. They pay just 10% down and cover the balance with monthly installments deducted from their paychecks. They pay no interest. The only cost to Multiplex is the finance charge on the money it fronts for the machines. Of the company's 40-odd office workers, 15 have already made purchases.

Kisling is convinced that the program not only improves technical skills inside the company, but also boosts employee morale. □

CHARTS: CYNTHIA DAVIS

HANDS ON

INNOVATION

WRITE IT DOWN

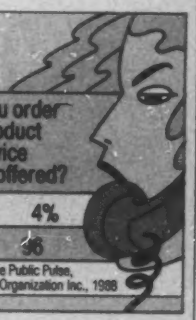
To be sure his company won't lose the ideas its employees come up with, William Donahoo, CEO of Clinch River Corp., provides every worker with a special pocket notebook for recording suggestions.

Donahoo was overwhelmed by suggestions when his company bought a Harriman, Tenn., paperboard plant and rehired laid-off workers. So he passed out three-by-five-inch notebooks marked, "Good Ideas for Clinch River."

Each week management lists each suggestion, the employee who made it, and its status. "In eight weeks, we got more than 100 ideas," Donahoo says. Nearly half of them are already being implemented. □

TELEMARKETING:

A CONSUMER'S VIEW



What did you do the last time you received a telephone sales call?		Generally, what do you think of those calls?		Did you order the product or service being offered?	
Listened all the way through	32%	Find calls useful	3%	Yes	4%
Cut the conversation short	41	Prefer not to get these calls	83	No	96
Just hung up	26	It depends			
Don't remember	1	Don't know			

Source: The Public Pulse, The Roper Organization Inc., 1988

OPERATIONS

SAFETY FIRST

You can make your manufacturing operation safer by making careful procedures a constant topic for discussion. So says Gordon Lankton, who has transformed the safety performance of his plastic injection-molding factory from substandard to award winning. At every Nypro Inc. meeting—whether held by the board of directors or the warehouse shipping crew—the first topic is always safety.

The issues covered range from how to drive a forklift and stack pallets properly to the development of a boot that won't slip on the clean-room floor. When an accident occurs, it is discussed in detail. Even the annual banquet begins with a year-to-year comparison of time lost due to job-related accidents.

Today the Clinton, Mass., company's annual accident rate hovers between 1 and 2 per 100 employees—which was good enough for an award from the National Safety Council. And healthier employees have contributed to a healthier bottom line. Nypro's workers' compensation bill has been cut from a peak of almost $500,000 per year to just $100,000. □

COMPENSATION

INSTANT GRATIFICATION

When handing out bonuses for extra or exemplary effort, it may be timing, not quantity, that matters most. William T. Quinn Jr., whose W. T. Quinn Inc. ranked #128 on the 1987 INC. 500 list of the fastest-growing companies in America, has found that his motivational dollars go further if he hands them out on the spot, just when the work load "gets really crazy." Employees at the Somerset, N.J., publishing company don't get a chance to doubt whether the boss is grateful for their extra effort. And morale is buttressed right at the moment when employees are most stressed.

"The dollar amount of the bonus," Quinn says, "takes a backseat to timing." He hands out what he calls Quinn Cash, mock $50 bills with his picture on the front and a note that reads, "Redeem this with an expense voucher for $50 worth of entertainment." Why require that the money be spent on fun? "I want my employees to go out and have a good time," Quinn says. "It helps relieve job stress—saving up bonuses for a television set wouldn't do that." □

FIGHTING DRUGS IN THE WORKPLACE

Testing: % of managers who think drug testing should be legal for use:	
As a preemployment requirement	81%
As a preemployment requirement for sensitive jobs	94%
On a random basis for all workers	53%

What to do: According to managers, employees using drugs at work should be:	Yes	No	Don't know
Dismissed	59%	28%	13%
Given counseling	95	4	2
Prosecuted	30	39	30

A survey of managers by the American Productivity & Quality Center found that slightly more than 40% of respondents thought there was a drug-abuse problem where they worked.

Source: American Productivity & Quality Center, 1988

HIRING

GET THE BAD NEWS, TOO

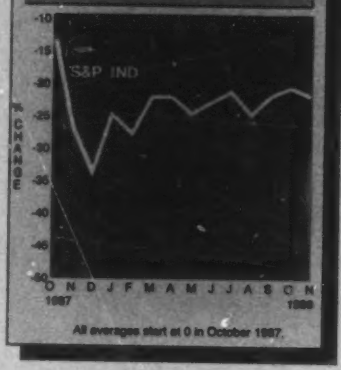
If you really want to get to know a job candidate, don't ask just for the usual references during an interview. Try asking for negative references—people with whom the applicant didn't get along.

Phil Thomas, chairman of the Thomas Group Inc., an Irving, Tex., consulting firm, has found that negative references are often more revealing than positive ones. While most job applicants will say initially they can't think of anyone who didn't like them, persistence will almost always result in some names—names that the surprised applicant probably hasn't had time to screen mentally. Those negative references and the potential hire's explanation of the problems invariably give Thomas a more balanced picture of the person's strengths and weaknesses. □

Reported by Teri Lammers, Martha E. Mangelsdorf, and Bruce G. Posner

INVESTING IN GROWTH COMPANIES

INC. vs. CONSERVATIVE AVERAGES



All averages start at 0 in October 1987.

INC. vs. SPECULATIVE AVERAGES

All averages start at 0 in October 1987.

IPOs IN THE AFTERMARKET

INITIAL PUBLIC OFFERINGS: OCTOBER 1988

O-T-C Sym.	Company	Business/product	Offering Size ($mil.)	Offering Price	First aftermarket bid	Underwriter
AMF[a]	ACM Managed Income	Closed-end fund	180.00	10.00	10	Merrill Lynch
RODS	American Steel & Wire	Makes steel rods & wires	25.27	9.00	9	Donaldson, Lufkin
ARIX	Arix	Designs & mfrs. multiprocessors	16.00	7.50	7⅝	Bear, Stearns
BIOH	Bioanalogics	Develops, mfrs., & sells computer prods.	4.05	3.00	4⅜	Paragon Capital
DCM[b]	Dreyfus CA Municipal Income	Closed-end investment co.	37.00	10.00	10	Paine Webber
DMF[b]	Dreyfus Municipal Income	Closed-end fund	180.00	10.00	10	Paine Webber
DNM[b]	Dreyfus NY Municipal Income	Closed-end fund	30.00	10.00	10	Paine Webber
FFFG	F.F.O. Financial Group	Savings & loan	6.50	5.75	6⅛	Williams Securities
GITN	Gitano Group	Designs & mfrs. jeans & sportswear	40.20	20.50	20¼	Goldman, Sachs
HOOSU	HQ Office Supplies Warehouse	Operates supply stores	6.60	6.00[c]	7⅜	D. H. Blair
KTF[a]	Kemper Municipal Income	Closed-end fund	372.00	12.00	12	Smith Barney
KBAZ	Kitchen Bazaar	Sells specialized cookware	2.50	2.00	2⅜	A. M. Levine
LMRK	Landmark Graphics	Supplies computer exploration systs.	16.00	8.00	8¼	Sheerson Lehman
LRIZ	Lindsay Manufacturing	Designs & mfrs. irrigation systs.	12.00	10.00	10⅛	R. G. Dickinson
MPV[a]	MassMutual Participation Investors	Closed-end fund	85.00	10.00	10	Dean Witter
METC	Metcalf & Eddy Companies	Provides environmental svcs.	19.57	14.50	16¼	Drexel Burnham
MWSP	Midwest Grain Products	Processes wheat	15.40	14.00	14⅛	William Blair
NTRK	Nestarik Health Technologies	Designs & mfrs. air-purifying systs.	4.86	6.75	6⅛	Investment Corp.
OFFI	Omni Films International	Designs & sells wide-screen cinema systs.	2.75	5.00	4⅜	Anderson-Bryant
RTG[a]	Racal Telecom PLC	Provides vehicle leasing svcs.	129.49	20.85	21⅛	Goldman, Sachs
RIF[b]	Resorts Income Investors	Real-estate investment trust	45.00	12.50	12⅜	Paine Webber
SLFX	Selfix	Mfrs. home-improvement prods.	7.00	7.00	7	Ladenburg, Thalmann
SIER	Sierra On-Line	Dvlps. & publ. entertainment software	15.80	9.00	9⅛	Piper Jaffray
SOFS	Softsel Computer Products	Sells microcom. hardware & software	12.00	8.00	8	Alex Brown
STX[a]	Sterling Chemicals	Mfrs. petrochem.	136.00	16.00	16	Goldman, Sachs
TVF[a]	Templeton Value Fund	Closed-end fund	150.00	10.00	10	Sheerson Lehman
VIM[b]	Van Kampen Merritt Cal.	Closed-end fund	28.00	10.00	10	Prudential-Bache
VSBC	VSB Bancorp	Bank	3.66	10.50	10⅝	Smith Barney
WAIN	Wainright Bank & Trust	Bank	15.75	15.75	15⅞	Ladenburg, Thalmann
WAU[b]	Wausau	Holding co. for United Express	15.20	9.50	9⅛	Drexel Burnham

Initial public offerings sold at $1 or less not included. First aftermarket bid is approximate. [a] trading on NYSE; [b] trading on AMEX; [c] units of 3 common + 3 warrants. Offering data source: *GOING PUBLIC: THE IPO Reporter*, a publication of The Dealer's Digest Inc., 150 Broadway, New York NY 10038.

CHARTS: IMAGEBUILDER DESIGN

COPYRIGHT © 1988 BY INC. PUBLISHING CORPORATION All rights reserved. Editorial and executive offices at 38 Commercial Wharf, Boston, MA 02110. INC. (ISSN 0162-8968) is published monthly by Inc. Publishing Corporation, 38 Commercial Wharf, Boston, MA 02110. Subscription rate for U.S. and Possessions, 12 issues $25. All subscription correspondence should be addressed to INC. magazine, P.O. Box 54129, Boulder, CO 80322-4129. Please allow at least six weeks for change of address. Include your old address as well as new, and enclose if possible an address label from a recent issue. Second class postage paid at Boston, MA, and additional mailing offices. Postage paid at Mississauga, Ontario. POSTMASTER: Send address changes to INC. magazine, P.O. Box 54129, Boulder, CO 80322-4129. Material in this publication must not be stored or reproduced in any form without permission. Requests for permission should be directed to Permissions Coordinator, INC., 38 Commercial Wharf, Boston, MA 02110. Inc. is a registered trademark of Inc. Publishing Corporation.